

BPA INVESTS IN THE ENVIRONMENT, FISH AND WILDLIFE

WHAT WE ACCOMPLISHED IN FY 2023





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About BPA

The Bonneville Power Administration is a nonprofit federal power marketing administration based in the Pacific Northwest. Although BPA is part of the U.S. Department of Energy, it is self-funding and covers its costs by selling its products and services. BPA markets wholesale electrical power from 31 federal hydroelectric dams in the Northwest, one nonfederal nuclear plant and several small nonfederal power plants. The dams are operated by the U.S. Army Corps of Engineers and the Bureau of Reclamation. The nonfederal nuclear plant, Columbia Generating Station, is owned and operated by Energy Northwest, a joint operating agency of the state of Washington. BPA provides about 28% of the electric power generated in the Northwest, and its resources — primarily hydroelectric — make BPA power nearly carbon free.

BPA also operates and maintains more than 15,000 circuit miles of high-voltage transmission in its service territory. BPA's territory includes Idaho, Oregon, Washington, western Montana and small parts of eastern Montana, California, Nevada, Utah and Wyoming.

BPA promotes energy efficiency, renewable resources and new technologies that improve its ability to deliver on its mission. To mitigate the impacts of the federal dams, BPA implements a fish and wildlife program that includes working with its partners to make the federal dams safer for fish passage.

BPA is committed to public service and seeks to make its decisions in a manner that provides opportunities for input from all stakeholders. In its vision statement, BPA dedicates itself to providing high system reliability, low rates consistent with sound business principles, environmental stewardship and accountability.

Why does a power marketing administration protect fish and wildlife?

Congress formally established Bonneville's responsibilities for the protection, mitigation, and enhancement of fish and wildlife affected by the development and operation of the Federal Columbia River Power System (FCRPS) in the Northwest Power Act of 1980. Today, fish and wildlife mitigation is the "third leg of the stool" of Bonneville's mission, along with power and transmission services. Bonneville implements a wide range of actions that consider, avoid, minimize and mitigate federal hydropower impacts on the Columbia River Basin's fish and wildlife resources to fulfill its obligations under the Northwest Power Act and the Endangered Species Act in a manner consistent with federal tribal trust and treaty responsibilities.

Bonneville implements its Northwest Power Act mitigation through two types of actions. First, Bonneville, together with the U.S. Army Corps of Engineers and the Bureau of Reclamation, conducts on-site actions at the dams in the FCRPS. Examples of on-site actions include fish passage infrastructure and water management. See the Hydropower section of this document for more information about on-site mitigation.

Second, BPA's Fish and Wildlife (F&W) Program focuses on off-site mitigation, or actions that cannot be accomplished at the FCRPS facilities and typically occur in locations away from the dams. Bonneville works with local, state, and tribal governments, as well as other federal agencies and non-governmental organizations, to implement a suite of actions to benefit fish and wildlife.

Bonneville funds hundreds of actions around the Pacific Northwest region each year. We are restoring fish habitat in tributaries of the Columbia River and its estuary. We are using hatcheries to increase fish abundance in the Columbia River Basin while also protecting the genetics of natural fish. We are reducing the number of ESA-listed fish eaten by birds, other fish, and marine mammals. We also monitor and evaluate the effects of these actions to ensure we are investing in the right actions in the right places. These actions are intended to have long-term benefits, such as restoring habitat as well as protecting land in perpetuity for fish and wildlife.



Legal drivers



1980 NORTHWEST POWER ACT

“The Administrator shall use the Bonneville Power Administration Fund to protect, mitigate, and enhance fish and wildlife affected by the FCRPS.”



ESA listed salmon and steelhead



Listed and unlisted resident fish



Wildlife



ENDANGERED SPECIES ACT, FCRPS BIOLOGICAL OPINIONS

“Each federal agency shall... insure that any action authorized funded, or carried out by such agency is not likely to jeopardize continued existence... of any endangered species.”



TRIBAL TRUST & TREATY PROVISIONS

BPA will consult with the Tribal governments prior to BPA taking actions, making decisions, or implementing programs that may affect Tribal resources.

Bonneville’s investments in the environment, fish and wildlife are driven or informed by a variety of legal requirements, primarily from the Northwest Power Act and the Endangered Species Act.

FISH & WILDLIFE PROGRAM AND LATEST ACCOMPLISHMENTS

65% | Tribes and states account for 65% of program funding, much of which is funded through the Accords.

Columbia Basin Fish Accords continue productive partnerships in the Pacific Northwest

Under a collection of agreements known as the Columbia Basin Fish Accords, Bonneville, the U.S. Army Corps of Engineers, and the Bureau of Reclamation partner with Northwest tribes and state fish and wildlife programs to implement on-the-ground projects that provide biological benefits to fish and wildlife species and help the agencies meet their environmental and mitigation responsibilities. These agreements have provided hundreds of millions of dollars towards fish and wildlife mitigation.

The Columbia Basin Fish Accords help balance many priorities. From the outset, the Accords provided firm commitments to habitat, hatchery, and other actions that result in tangible benefits to salmon and other fish and wildlife species. Since 2008, Accords projects included restoring river and estuary habitat, enhancing hatchery operations, and improving fish passage over federal dams for species like lamprey. The Accords also strengthen our state and tribal mitigation partnerships by providing certainty for long-term funding and planning for fish and wildlife projects.

Bonneville has a long history of taking action to mitigate the impacts on fish and wildlife caused by the federal dams in the FCRPS, beginning

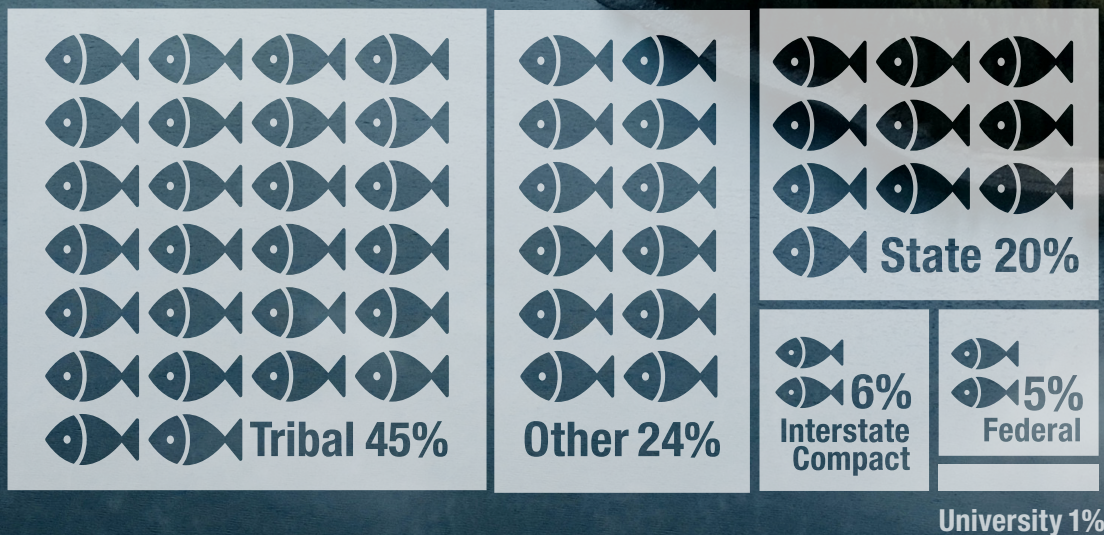
even before the passage of the Northwest Power Act in 1980.

Historic milestones

- Bonneville collaborated with the region, including tribes, to allocate additional funds to fish and wildlife mitigation made available through Bonneville's Reserves Distribution Clause (RDC), which triggered in fiscal years (FY) 2022 and 2023. Bonneville allocated \$50 million from the FY 2022 RDC distribution towards high-priority, non-routine fish hatchery maintenance over the next five years. Bonneville also allocated \$30 million from the FY 2023 RDC distribution to accelerate implementation of additional fish and wildlife mitigation actions in the coming years.
- In 2023, Bonneville signed a historic agreement to fund in part a plan developed by the Upper Columbia United Tribes to test feasibility of, and ultimately implement, the reintroduction of non-ESA listed salmon above Chief Joseph and Grand Coulee dams in the Upper Columbia River Basin. In the agreement, Bonneville commits to providing \$10 million in funding annually over 20 years to help implement the plan. The agreement is a significant milestone in regional efforts to reintroduce salmon to the Upper Columbia River Basin.
- Bonneville and the region have achieved a long-term stay of the decades-long legal

FY23 Fish and Wildlife Expenditures

BY FUNDING GROUPS



proceedings over the effects of operations and maintenance of the federal dams on ESA-listed species. This stay, resulting from an agreement between federal agencies, the Lower Columbia River tribes, a coalition of environmental and

fishing groups, and the states of Oregon and Washington, is intended to redirect the parties' time, energy, and resources out of the courtroom and into physical actions to benefit the environment, fish, and wildlife.

Since 2005¹, Bonneville's Fish & Wildlife Program has provided the following benefits to the environment, fish and wildlife in the Pacific Northwest

¹ Bonneville established the interactive web portal cbfish.org to "provide the public with an unprecedented view into Bonneville Power Administration's implementation of the Columbia Basin Fish & Wildlife Program, which spans across a four-state region and is the largest environmental program of its kind in the world. Scope of this site includes project proposals from fiscal year 2007 forward, and budget adjustments from 2004 forward."



ACRES OF HABITAT

Improved more than **854,000 acres** of habitat, an area equivalent to more than **9 times** the size of the city of **Seattle**.



LAND FOR WILDLIFE

Protected more than **1.2M acres** of land for wildlife and conservation, an area equivalent to nearly **twice** the size of **Siuslaw National Forest**.



ACRES FOR WILDLIFE

49,000+ acres protected for wildlife as focal species. This area is equivalent to about **twice** the size of **Eugene, Oregon**.



ESTUARY FLOODPLAIN

Restored or protected nearly **17,000 acres** of estuary floodplain, an area equivalent to more than **100 times** larger than **Boise's Anne Morrison Park**.



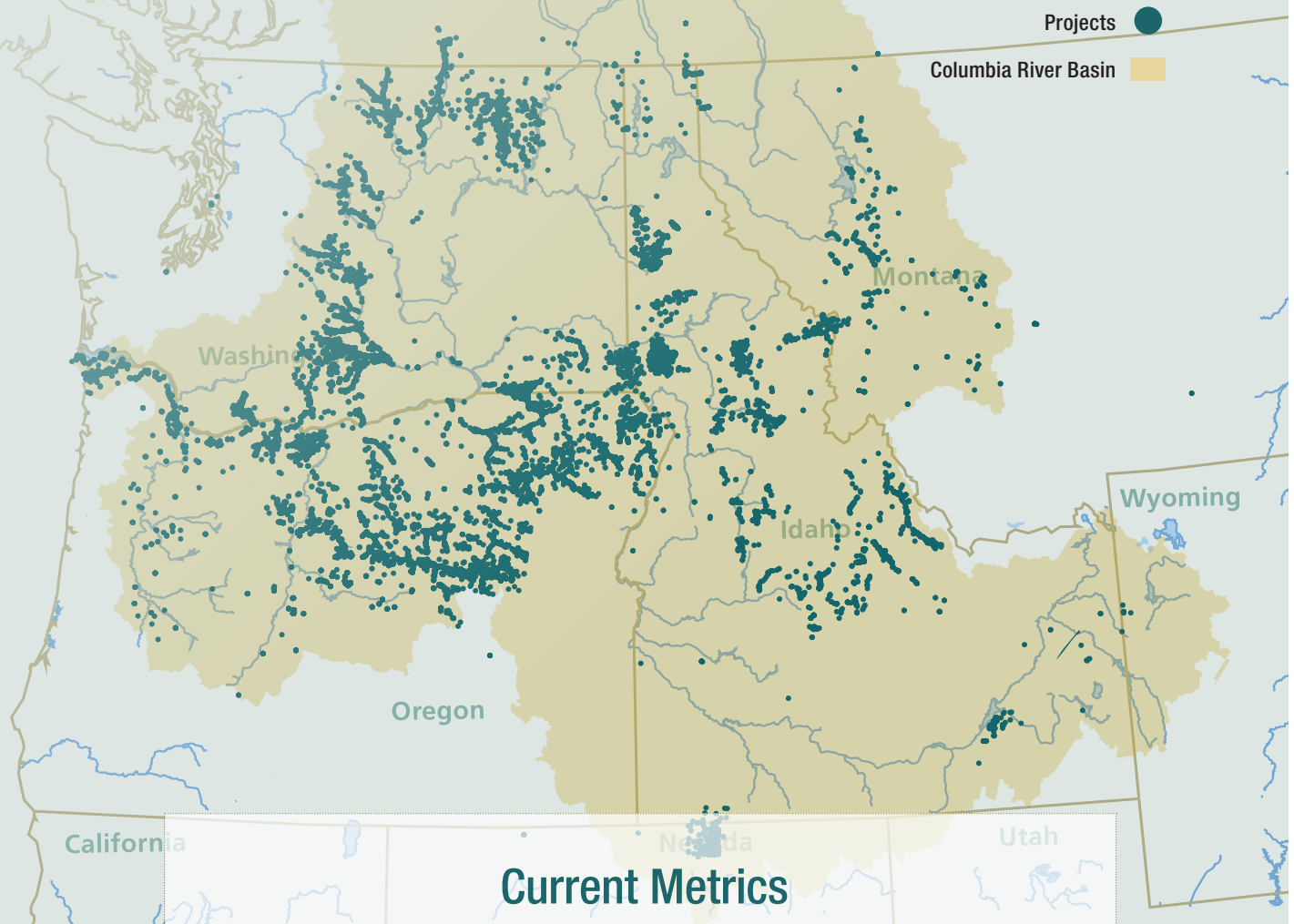
ESTUARY TIDAL CHANNELS

Enhanced or restored **70 miles** of estuarine tidal channels, a length equivalent to longer than the **driving distance** between **Portland and Hood River**.



11
HATCHERIES BUILT

Fish & Wildlife Actions in the Region



Projects ●

Columbia River Basin

Current Metrics

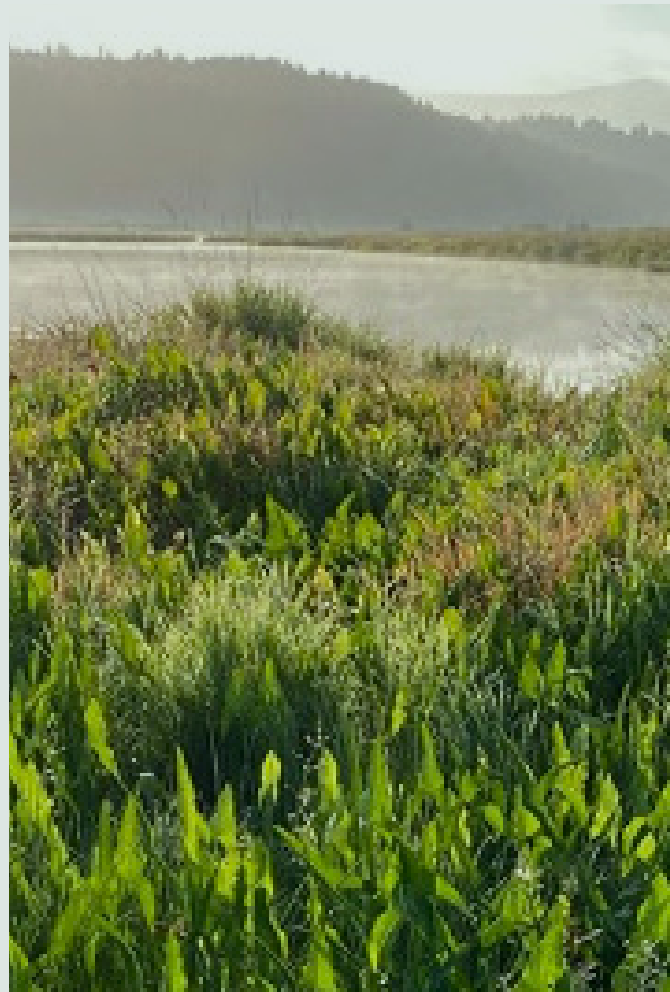
AREA	DESCRIPTION	FY 2023	SINCE 2005
Tributary habitat restoration	Miles of habitat accessed	105	5,668
	Acres of habitat improved	43,058	854,469
	Miles of stream with improved complexity	76	956
Estuary habitat restoration	Restored or protected floodplains (acres)	46	16,832
	Restored channel (miles)	-	70
Columbia Basin water transactions	Flow protected (cubic ft per second)	162	15,216
	Flow enhanced (acre-feet)	95,165	2,625,165
Hatchery production	Number of juveniles released	19,541,991	347,451,138
Predator removal	Pikeminnow removed	156,505	3,210,043

Restoring and protecting habitat

Bonneville partners with state, tribal, and local governments, other federal agencies, and non-governmental organizations to protect, mitigate, and enhance fish and wildlife habitat throughout the Columbia River Basin, with a focus on fish spawning and rearing habitat. Bonneville funding has informed ecosystem-based projects across the Basin. These projects restore and protect habitat, including stream channels and floodplains, and provide benefits such as reconnecting estuarine tidal channels, enhancing flow volume and timing, expanding cold water refuges, and improving fish passage to increase access to fish habitats. These habitat improvement actions provide both near-term and long-term benefits to anadromous fish and other species, including Kootenai River white sturgeon, bull trout, and westslope cut-throat trout.

Bonneville works with willing landowners to acquire real property rights, such as permanent conservation easements, to ensure the long-term protection of lands on which Bonneville-funded fish and wildlife habitat projects are implemented.

In addition to habitat actions, Bonneville funds the Columbia Basin Water Transactions Program, which was developed by Bonneville and the National Fish and Wildlife Foundation (NFWF) in 2002, to address chronically diminished stream flows in tributaries of the Columbia River. To enhance stream flow, this program works through locally-based entities to acquire water rights voluntarily from willing landowners. Using temporary and permanent water rights acquisitions and other incentive-based approaches, the program supports grantees in Oregon, Washington, Idaho, and Montana to help landowners who are interested and willing to restore flows to key fish habitat voluntarily. Voluntary, market-based water transactions provide an effective and fair way to balance out-of-stream water uses with the need to maintain stream flow for fish.



Estuary habitat

SPOTLIGHT ACCOMPLISHMENT

Looking for a place to connect to the natural beauty found in the Columbia River Gorge National Scenic Area? Look no further than the Steigerwald Lake National Wildlife Refuge just east of Washougal, Washington. The refuge is part of the Columbia River estuary and a vital feeding and resting area for juvenile salmon making their way to the Pacific Ocean. In just the few years since Bonneville initiated the restoration, Steigerwald has undergone a major transformation as workers completed multiple updates:

- Removed 2.2 miles of levee, connecting the river to its historic floodplain for the first time in more than 50 years.



- Expanded the refuge by 160 acres.
- Restored salmon-bearing Gibbons Creek to its natural channel and removed the fish ladder at the confluence of the creek and the Columbia River, providing unobstructed access for salmon and lamprey.
- Created more than 100 acres of wetland and reforested 250 acres of riparian habitat.
- Added over a mile to the existing trail that meanders through the refuge.

Bonneville's \$24 million investment in the Steigerwald Reconnection Project makes it the largest estuary restoration project the agency has funded to date. Its accomplishment is the result of partnership with the Lower Columbia Estuary Partnership, U.S. Fish and Wildlife Service, City of Washougal, and the Port of Camas-Washougal.

Steigerwald's location, close to the Columbia River Gorge, makes it the first significant estuary habitat restoration project that juvenile salmonids will encounter on the Washington side of the Columbia River when migrating downstream.

The Steigerwald Lake National Wildlife Refuge is more than 1,000 acres of wetlands, pastures and woodlands along the Columbia River. It is home to many species of plants, fish and wildlife, including the western chorus frog.

Now that the floodplain's connection to the river has been restored, upriver juvenile salmon are already being detected on-site, where they can rest and be nurtured by the environment. Additionally, the reconnected historical channel networks flowing through the site, combined with the newly planted native vegetation, will bring nutrients and prey into the mainstem Columbia, making those resources available to fish not directly accessing the habitat restoration site.

Tributary habitat

SPOTLIGHT ACCOMPLISHMENT

Bonneville and its partners completed several large habitat improvement projects throughout the Columbia River Basin, including the following example from the John Day River. This project—Vinegar to Vincent Habitat Restoration Project—was a multiyear effort to improve instream and floodplain habitat on the Middle Fork John Day



River Forest Conservation Area, a key area for spring Chinook salmon and threatened steelhead.

Degraded habitat is considered one of the major factors contributing to the decline of both steelhead and Chinook salmon. On the Middle Fork John Day River, high water temperatures are of particular concern. Over time, human activities have disconnected and confined the floodplain and reduced riparian vegetation significantly. This has increased effects to the river from the sun and reduced interaction with the floodplain and groundwater. Reconnecting the floodplain helps replenish groundwater sources, which, in turn, provides consistent cool water back to the river in the hot summer months. This is vital for the survival and success of rearing juveniles and returning adults.

The project:

- Removed nearly 1 mile of historic railroad grade confining the floodplain.
- Created 1.5 miles of secondary channels.
- Enhanced 1 mile of existing main channel.
- Installed 250 large wood complexity structures.
- Placed 380 instream large wood support structures.
- Reconnected 80 acres of floodplain.
- Planted dense vegetation on channel margins and floodplain.
- Used a hydraulic stinger to help assure plant survival. A hydraulic stinger is an excavator-mounted planting implement that assures the plants roots are installed deeply, within the water table, to help maximize survival and eliminate the need for irrigation when installed in an area with a connected and functional floodplain.

Project partners included the Confederated Tribes of the Warm Springs Reservation of Oregon and the Bureau of Reclamation, with funding for the project provided by Bonneville, Oregon Watershed Enhancement Board, U.S. Fish and Wildlife Service, and the Pacific Coastal Salmon Recovery Fund.

The images to the right show the project area before implementation (top left) and during Phase 2 work (top right). The red line on the left image identifies the railroad grade, which separated the two project phases. The project was phased due to the scale of the project and to allow vegetation growth after Phase 1 construction. Work was completed during the summer and fall of 2022 with the removal of the railroad grade, channel excavation, channel filling, large wood placement, all in-water work and planting. The bottom photos were taken in spring 2023. The left photo is pre-project and the right photo shows the connected floodplain post restoration. The yellow and red circles provide references to features in each photo.



Increasing fish abundance in the river through hatcheries

Bonneville funded construction and currently funds the operation and maintenance of more than 20 hatcheries. These hatcheries provide conservation and supplementation throughout the Columbia River Basin to preserve, rebuild, and reduce extinction risk for ESA-listed fish. For example, the Snake River Sockeye Hatchery Program is a “safety net” hatchery to conserve the genetic material of the population and to maintain fish whose genes are as close as possible to those of their wild ancestors. In addition, these hatcheries help Bonneville meet Northwest Power Act obligations to protect, mitigate and enhance fish and wildlife affected by the Federal Columbia River Power System.

Many of these hatchery fish support tribal, commercial, and sport harvest. The conservation hatchery programs help rebuild and enhance the naturally reproducing ESA-listed fish in their native habitats using locally adapted broodstock, while maintaining genetic and ecologic integrity and supporting harvest where and when consistent with conservation objectives.

Hatcheries

SPOTLIGHT ACCOMPLISHMENT

Bonneville, in partnership with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), completed construction of the Imtwaha Hatchery in 2021. The hatchery is on the South Fork Walla Walla River, about 9 miles east of Milton-Freewater, Oregon.

The hatchery produces fish to help restore a population of spring Chinook that were extirpated from the Walla Walla River in the mid-1990s. Construction and operation of the hatchery was recommended by the Northwest Power and Conservation Council and is a component of the Fish Accord between Bonneville and CTUIR. CTUIR operates the hatchery in coordination with the Oregon Department of Fish and Wildlife.

In 2023, the hatchery released 477,420 spring Chinook smolts into the Walla Walla River. Some fish were released directly at the hatchery, while others were released a few miles upstream from the mouth of the Walla Walla River.

5.4M+ | Since 1990, 5.4 million predatory northern pikeminnow removed, safeguarding juvenile salmon and steelhead.

Predator management to conserve salmon and steelhead

Bonneville helps to address annual losses of juvenile and adult salmon and steelhead consumed by predators. Specifically, three groups of animals prey on salmon: fish (piscine), pinnipeds (primarily sea lions), and birds (avian). Birds and fish eat mostly juvenile salmon and steelhead migrating to the Pacific Ocean as smolts, while sea lions mostly eat adult salmon and steelhead returning to spawn in their natal tributaries of the Columbia River. Bonneville funds monitoring of the effectiveness of various management techniques to reduce predation from these three groups. Collectively, these efforts have increased survival of migrating salmon and steelhead. The most common techniques used by regional managers include hazing (avian and pinniped) and lethal removal (piscine and pinniped) of predators to reduce predatory losses of salmon and steelhead.

The most successful and longest running predator management program that Bonneville funds is the Northern Pikeminnow Sport Reward Fishery Program. Since 1990, this annual program has removed approximately 5.4 million predatory northern pikeminnow, conserving countless juvenile salmon and steelhead that could have otherwise been eaten by the predator. The Northern Pikeminnow Sport Reward Fishery Program is unique in that it relies on public anglers to catch predators greater than 9 inches and turn them into catch stations for reward payments. In 2023, anglers removed 156,505 northern pikeminnow from May through September.

Research, monitoring, and evaluation

Bonneville funds research, monitoring, and evaluation (RM&E) that provides essential information to assess accomplishments and inform management actions to benefit fish and wildlife. Specifically, Bonneville's RM&E program provides critical information needed to track and

effectively manage hydropower operational success, priority species status and trends, habitat restoration actions, and hatchery operations. The geographical scope includes mainstem, tributary, and estuarine habitats of the Columbia River Basin.

Research, monitoring & evaluation

SPOTLIGHT ACCOMPLISHMENT

- **StreamNet:** StreamNet is a cooperative information management and data dissemination project focused on fisheries and aquatic data and data-related services in the Pacific Northwest, with a focus on the Columbia River Basin. The StreamNet project has recently improved search and display capabilities of key abundance monitoring metrics for adult spawners, juveniles migrating out to sea, and smolt-to-adult returns through maps, tables, or other visual summaries. This represents an important advancement in user access.
- **Columbia River Basin Tributary Habitat RM&E Strategy:** In October 2022, after years of regional collaboration and development, Bonneville finalized the Columbia River Basin Tributary Habitat RM&E Strategy—a collaborative approach to identifying RM&E habitat actions in the Columbia River Basin. Based on key management questions, a strategic path, and a consistent set of indicators, the document provides guidance for linking tributary habitat project implementation to RM&E concerning compliance, status, trends, and effectiveness. The strategy reinforces the need for consistent, standardized tributary habitat RM&E reporting, while allowing for flexibility in monitoring methods. It also reinforces the importance of data reporting standards necessary to promote Columbia River Basin-scale evaluation and adaptive management.



Top: Approximately 500,000 spring Chinook are raised in these tanks each year.

Bottom: The Northern Pikeminnow Sport Reward Fishery removes voracious predators of young salmon and steelhead.



FUNDING AND

ENSURING RESULTS

Bonneville manages its Fish & Wildlife Program with an emphasis on prioritizing investments in actions that enable the agency to meet its obligations under the laws authorizing the Federal Columbia River Power System and other applicable laws. We rely on the development and application of the best available science and data, including independent scientific review of Bonneville's mitigation projects, to inform agency decision-making and evaluate program performance. We are committed to strong research, monitoring, and evaluation, which helps us focus our efforts on effective actions and allows for refinements in our approach as we and our partners learn from past actions.

Bonneville implements fish and wildlife mitigation projects in a manner consistent with the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program. The Council recommends fish and wildlife mitigation projects to be funded through Bonneville's annual fish and wildlife budget. Before the Council makes its final project funding recommendations, an Independent Scientific Review Panel (ISRP) appointed by the Council reviews proposed fish and wildlife mitigation projects for consistency with the Council's program and to ensure that those projects are based on sound scientific principles, benefit fish and wildlife, and have a clearly defined objective and outcome with provisions for monitoring and evaluating results. Following the ISRP's review of those projects, the Council makes its recommendations to Bonneville. Bonneville considers these external reviews and recommendations of proposed projects to inform funding decisions.

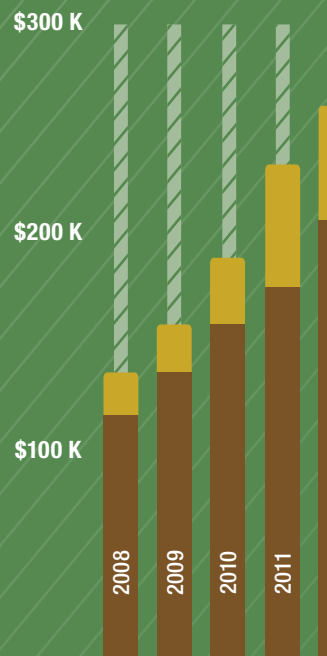
Bonneville's fish and wildlife mitigation is not funded by U.S. taxpayers. Rather, it is paid for through the electric rates of utilities that buy power from the agency.

FY23 F
Cap

EXPENSE: \$245.2

CAPITAL: \$14.6 M

Fish &
His



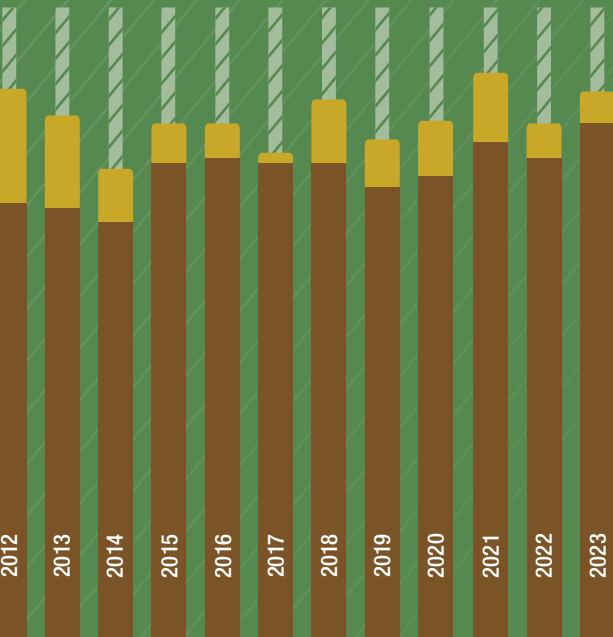
Fish & Wildlife Program Capital and Expenditures



2 M

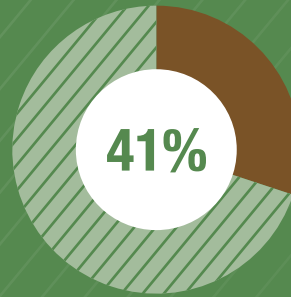
M

Wildlife Direct Program Historical Expenditures

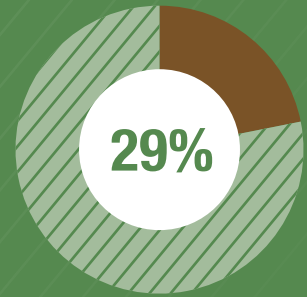


FY23 Fish & Wildlife Expenditures

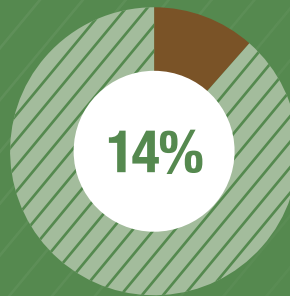
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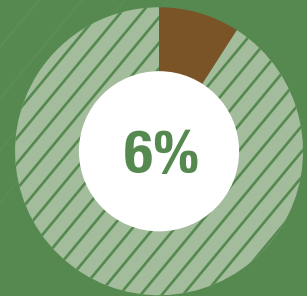
HABITAT RESTORATION & PROTECTION



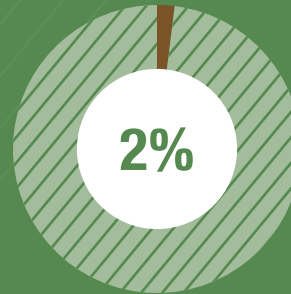
RESEARCH, MONITORING & EVALUATION



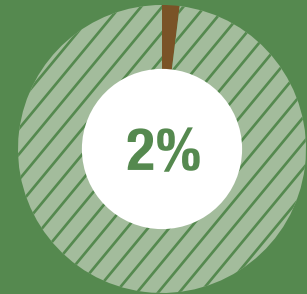
HATCHERY PRODUCTION (SUPPLEMENTATION)



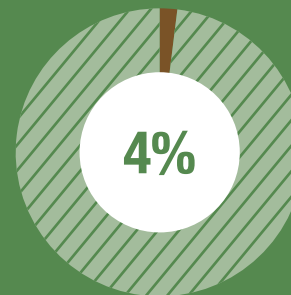
COORDINATION (LOCAL & REGIONAL)



PREDATOR REMOVAL



DATA MANAGEMENT



HARVEST AUGMENTATION



LAW ENFORCEMENT

Bonneville funds hundreds of fish and wildlife projects in the Columbia Basin, including habitat restoration, hatcheries, land acquisitions, predator control, and research and evaluation.

Bonneville incurs costs for fish and wildlife mitigation three main ways:

- **Bonneville’s Fish and Wildlife Program** Bonneville funds hundreds of fish and wildlife projects in the Columbia River Basin, including habitat restoration, hatcheries, land acquisitions, predator control, and RM&E through its Fish & Wildlife Program.
- **The “joint share” of mitigation** Bonneville pays for the “power share” of “joint” costs—the portion of the U.S. Army Corps of Engineers and Bureau of Reclamation’s costs that are allocated to hydropower—of the cost to operate and maintain fish passage improvements at the federal dams and for the operation and maintenance of certain hatcheries managed by the Corps, Reclamation, and the U.S. Fish and Wildlife Service through the Lower Snake River Compensation Plan. This payment is either made directly to the other agencies or as a repayment to the U.S. Treasury.
- **Power purchases** Fish operations, such as spilling water over dams rather than passing it through turbines, can limit the amount of electricity generated at the dams. If fish operations cause Bonneville to purchase power to meet its load obligations, the cost of purchased power is identified as a fish cost.

In addition to the ratepayer dollars that Bonneville invests in fish and wildlife, a number of other federal agencies are actively involved in Columbia River Basin fish and wildlife protection. These agencies, collectively known as the Columbia Basin Federal Caucus, include the U.S. Army Corps of Engineers and the Bureau of Reclamation, the U.S. Fish and Wildlife Service, the U.S. Forest Service, National Oceanic and Atmospheric Administration, the U.S. Environmental Protection Agency, and others.

² Non-power share costs are associated with operations related to barge transportation, flood control, irrigation or other authorized purposes at federal projects.





HYDROPOWER

At Little Goose Dam, BPA saved millions of dollars and minimized the impact to fish passage by working closely across the EFW, Transmission and Power organizations to accomplish a much needed powerhouse roof replacement concurrently with Grid Modernization upgrades.

Bonneville contributes to the continued provision of a reliable hydropower supply while ensuring that operation of the Federal Columbia River Power System supports fish passage and survival through the system. Bonneville engages in multiple regional forums to coordinate and ensure that hydro system operations minimize fish passage impacts while maintaining system function and reliability. Effectively balancing these objectives is accomplished through implementation of the annual Water Management Plan, Fish Operations Plan, and Fish Passage Plan prepared by the U.S. Army Corps of Engineers in coordination with Bonneville and other regional partners. In 2023, operations at 14 federal multiple purpose projects (dams) in the FCRPS were managed in accordance with the proposed action consulted upon in the 2020 National Marine Fisheries Service and U.S. Fish and Wildlife Service Columbia River System biological opinions (BiOps) and analyzed in the Columbia River System Operations Environmental Impact Statement (CRSO EIS). Operations were subsequently modified according to the terms of the stay agreement pausing litigation over challenges to the BiOps and CRSO EIS.

These modified operations included increased spring spill at six projects and extended fall spill operations at five projects for returning adult steelhead that swim past their intended tributary (“overshoot”) and must pass back downstream

through a dam. Spring spill operations will occur April through June and summer spill operations will occur June through August, with an earlier spill reduction date to be consistent with data on fish passage at both the four lower Snake River projects and the four lower Columbia River projects.

A by-product of increased spill is lower detection rates from passive integrated transponder (PIT) tags because there are more fish passing via spill and fewer going through the juvenile bypass systems where PIT detection infrastructure is located. The lower detection rates impact the ability to provide adequate measures of survival and the impacts of higher spill operations. Bonneville, in coordination with regional fish managers, has taken steps to improve future detection rates by installing PIT tag detectors in the estuary and investigating improved PIT detection capabilities at Bonneville and McNary dams. These improvements will help evaluate high spill operations as well as overall system survival. Another potential concern of high spill operations is the impact on adult salmonids. As adults move upriver, the increased spill can delay them from finding fish ladder entrances or cause “fallback.” Fallback is when fish pass the dam, go back downstream through the spillway due to high flows, and are forced to re-ascend the fish ladders. Fallback is an unintended consequence that will be examined through future high spill evaluations.

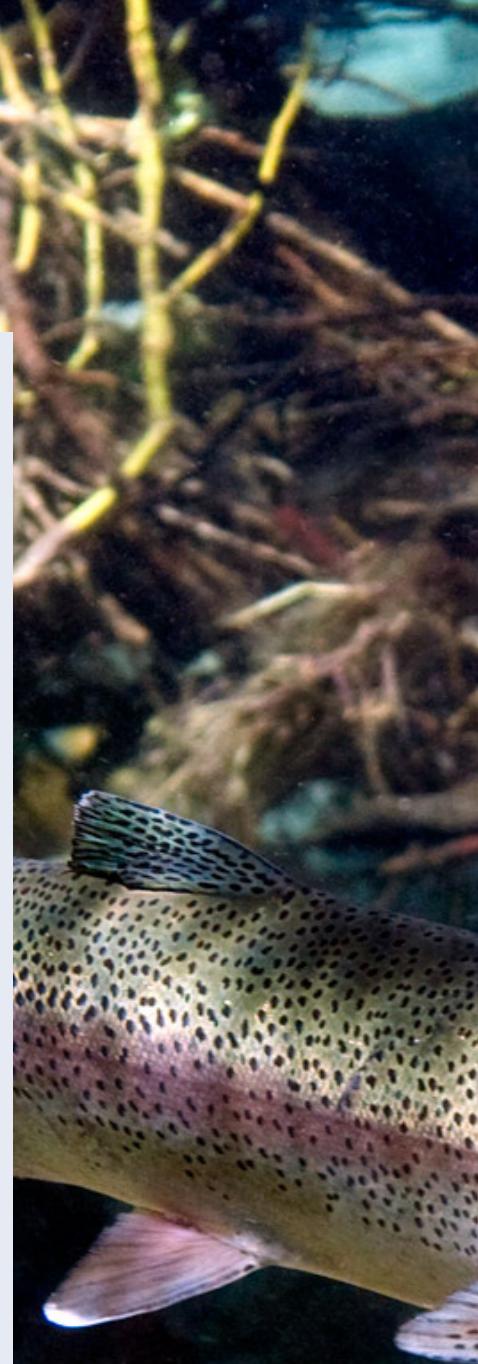


Hydropower

SPOTLIGHT ACCOMPLISHMENTS

Bonneville made an important upgrade to transmission system metering, one of the agency's many Grid Modernization projects. Initially, the work was scheduled at a time of year and for a duration that would have not only been costly but also detrimental to fish passage at the dams. Based on advice from Fish & Wildlife Program staff, the outages associated with the work at Lower Granite, Little Goose, and Lower Monumental dams were moved to the winter when fish are less active, and the duration of the outages was reduced from months to days.

At Little Goose Dam, Bonneville saved millions of dollars and minimized the impact to fish passage by finding a way to accomplish a much-needed powerhouse roof replacement concurrently with some of the Grid Modernization upgrades, thereby reducing the duration of the outages necessary for the work. At John Day Dam, work was coordinated between the Grid Modernization project and a project to replace a line from the dam to the substation. The timing and order of which lines were taken out of service was critical to minimize fish passage concerns as well as impacts to salmon harvest at the tribal fishing platforms downstream of the dam. These successful efforts required foresight to identify potential impacts as well as extensive coordination to align a diversity of numerous entities and objectives.





Habitat restoration projects exemplify ecosystem services and mitigate forces against natural disasters and climate change.

Climate change impacts

Bonneville's actions to improve connectivity and stream flow, in addition to other mitigation actions for endangered and threatened species, have and will continue to provide a buffer against the effects of climate change.

Bonneville prioritizes fish and wildlife projects based on well-defined criteria, such as whether a project protects or restores high-quality habitat, addresses connectivity, and helps with migration and areas of high fish mortality. Climate change is one of the considerations for both short- and long-term planning in the Fish & Wildlife Program.

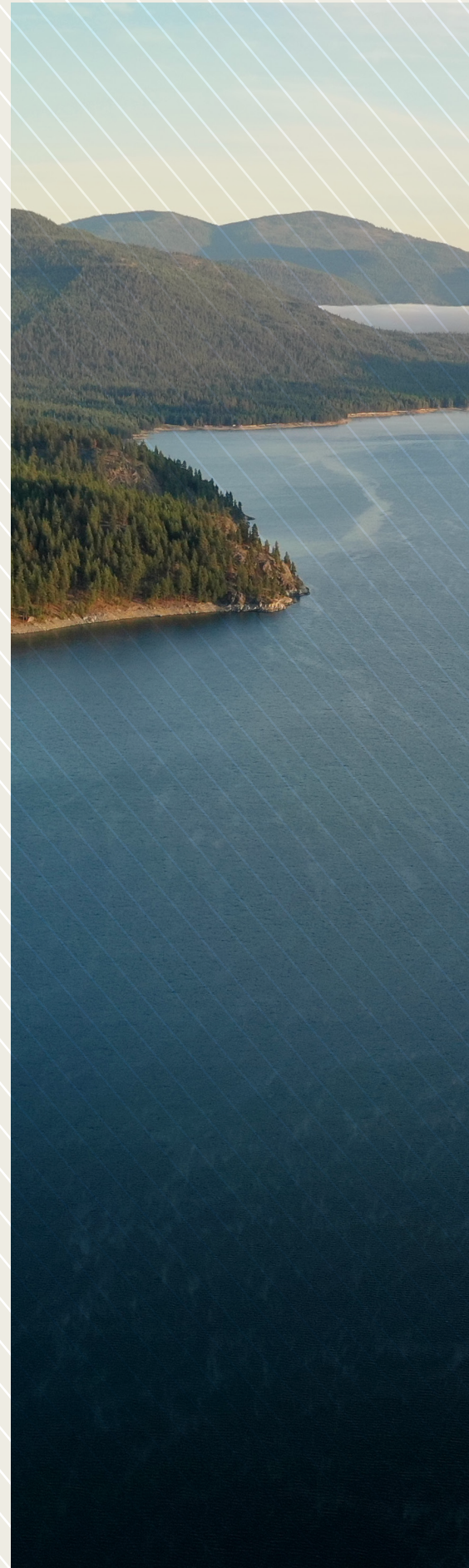
In its 2021 fiscal year report to Congress, the National Oceanic and Atmospheric Administration said, "Habitat restoration projects exemplify ecosystem services and mitigate forces against natural disasters and climate change. For example, floodplain restoration reduces flood risk and can lower flood insurance rates. Planting native trees and vegetation naturally sequesters carbon and stores it in plants and soils, increasing nature's carbon storage. The greatest socio-economic implication of salmon recovery is in securing healthy ecosystems that ultimately provide vast public and private benefits for current and future generations."

Moving forward

Bonneville's Fish & Wildlife Program mitigates impacts to fish and wildlife caused by the construction and operation of the Federal Columbia River Power System. While salmon and steelhead are important species of focus for the Fish & Wildlife Program, the status of salmon and steelhead populations in the Columbia River Basin are influenced by numerous factors, some of which are beyond Bonneville's legal authority, responsibility, or control to address.

Bonneville works to carry out our mitigation responsibilities toward salmon and steelhead as well as other fish and wildlife species such as bull trout, Kootenai River white sturgeon, and lamprey in partnership with tribes, states, other federal agencies, and other regional partners who have roles in the conservation and recovery of these species. We also actively participate in regional discussions for the overall recovery of salmon. Bonneville often works to maximize the beneficial impact of its fish and wildlife funding by encouraging cost-share and collaborations with other sources of funding. In 2023, Bonneville contractors reported over \$55 million in cost-share contributions from other sources for projects implemented with Bonneville funding. These were both cash (\$36 million) and in-kind (\$19 million) contributions.

Note that Bonneville's mitigation requirements are different from ESA recovery targets. Recovery of a species is a regional goal that will require a regional coordinated effort with consideration of all impacts to fish, such as climate change, human population growth, urbanization, development of cities and other land uses, water diversions for all purposes, federal and non-federal dams, mining, farming, ranching, logging, predation, ocean conditions, loss of habitat, harvest, and other impacts. Within our legal authorities and responsibilities, Bonneville will continue to work with our partners to mitigate impacts of the Federal Columbia River Power System on fish and wildlife, provide a reliable and affordable source of carbon-free electricity, and promote economic vitality for all the communities who depend on the Columbia River for their way of life.





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DOE/BP-5280 • April 2024